

CLAIMS

1. A method for producing a nitridosilicate-based compound, comprising reacting a material containing an alkaline-earth metal compound capable of
5 generating an alkaline-earth metal oxide MO, where M is at least one element selected from Mg, Ca, Sr, and Ba; and O is oxygen, by heating, a silicon compound, and carbon in an atmosphere of nitriding gas.
2. The method for producing a nitridosilicate-based compound according to
10 claim 1, wherein the alkaline-earth metal compound is at least one compound selected from a carbonate, an oxalate, an oxide, and a hydride of alkaline-earth metal.
3. A method for producing a nitridosilicate-based compound, comprising
15 reacting a material containing a rare earth compound capable of generating a rare earth oxide LnO or Ln₂O₃, where Ln is at least one element selected from rare earth elements of atomic numbers 21, 39, and 57–71; and O is oxygen, by heating, a silicon compound, and carbon in an atmosphere of
nitriding gas.
- 20 4. The method for producing a nitridosilicate-based compound according to claim 3, wherein the rare earth compound is at least one rare earth compound selected from a carbonate, an oxalate, an oxide, and a hydride of a rare earth element.
- 25 5. A method for producing a nitridosilicate-based compound, comprising reacting a material containing at least one selected from alkaline-earth metal, a nitride of alkaline earth metal, rare earth metal, and a rare earth nitride, a

silicon compound, and carbon in an atmosphere of nitriding gas.

6. The method for producing a nitridosilicate-based compound according to any one of claims 1, 3, and 5, wherein the silicon compound is at least one
5 compound selected from silicon nitride and silicon diimide.
7. The method for producing a nitridosilicate-based compound according to any one of claims 1, 3, and 5, wherein the nitriding gas is at least one gas selected from nitrogen gas and ammonia gas.
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8. The method for producing a nitridosilicate-based compound according to any one of claims 1, 3, and 5, wherein the reaction is performed by heating.
9. The method for producing a nitridosilicate-based compound according to
15 any one of claims 1, 3, and 5, wherein the carbon is solid-state carbon.
10. A method for producing a nitridosilicate-based compound according to any one of claims 1 and 5, wherein a nitridosilicate-based compound is produced in which the number of atoms of oxygen is smaller than that of
20 alkaline-earth metal per mol of nitridosilicate-based compound.
11. The method for producing a nitridosilicate-based compound according to claim 3, wherein a nitridosilicate-based compound is produced in which the number of atoms of oxygen is smaller than the number obtained by
25 multiplying the number of atoms of rare earth metal by 1.5 per mol of a nitridosilicate-based compound.
12. The method for producing a nitridosilicate-based compound according to

any one of claims 1 and 5, wherein a compound represented by a general formula: $M_2Si_5N_8$, where M is at least one element selected from Mg, Ca, Sr, and Ba, is produced.

5 13. The method for producing a nitridosilicate-based compound according to any one of claims 1, 3, and 5, wherein the nitridosilicate-based compound is a nitridosilicate-based phosphor.

10 14. The method for producing a nitridosilicate-based compound according to claim 13, wherein the nitridosilicate-based phosphor is represented by a general formula selected from $M_2Si_5N_8:Eu^{2+}$, $M_2Si_4AlON_7:Eu^{2+}$, $MSiN_2:Eu^{2+}$, and $M_2Si_5N_8:Ce^{3+}$, where M is at least one element selected from Mg, Ca, Sr, and Ba.

15 15. The method for producing a nitridosilicate-based compound according to claim 13, wherein the nitriding gas is mixed gas of nitrogen and hydrogen.

16. A nitridosilicate phosphor comprising a nitridosilicate compound represented by a general formula: $MSiN_2$ as a phosphor base material, and
20 Eu^{2+} ions as a luminescent center,
wherein a main component of the M is Ba.

17. A light-emitting apparatus using, as a light-emitting source, a nitridosilicate phosphor comprising a nitridosilicate compound represented
25 by a general formula: $MSiN_2$ as a phosphor base material, and Eu^{2+} ions as a luminescent center,
wherein a main component of the M is Ba.